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# BUTTER SCORING CONTEST 1910

BY  
LEON M. DAVIS



PRIZE CUPS FOR 1910

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There is probably no industry in California which is making such rapid growth as that of dairying. Adapted, as most parts of the state are to the business, it is, in view of present high prices paid for butterfat, one of the most profitable branches of agriculture. The increase in production of milk and cream has found a ready home-market, until at present the 195 California creameries have an annual output of 44,000,000 pounds of butter. The great activity of manufacturers in attempting to obtain a continuous supply of milk and cream has resulted in an age of keen competition,—competition which means failure to that concern whose methods are short of knowing every detail connected with their business, and in this day of the strenuous life, with competition on every hand, it is the progressive man everywhere who succeeds. The creameryman can be no exception to this rule, for his business offers great inducements to idle capital. Perhaps in no way can competition be more easily overcome than by the manufacture of a very high grade product. Quality determines demand. The up-to-date buttermaker it is, who strives for quality and who keeps posted on the grade of his product, as compared with that of his neighbor. An ideal position would enable him to examine markets to determine the standing of his butter, but such is impossible. It was with the thought of helping these busy buttermakers that the California Educational Butter Scoring Contest was begun in 1909. The value of educational contests depends on the individual. The mere sending of an entry shows a willingness to learn, which is the most important step toward better efficiency. A considerable amount of work is necessary in successfully conducting the contests. Reports must be written, time must be given to scoring, the testing of all the samples for moisture and salt represents days of work in the laboratory, and the compilation of data is no small task. However, the energy is well spent if an increased interest in better creamery methods is created among the buttermakers of the state.

The plan followed in the second contest was similar to that of the first. Each contestant, at specified times, shipped an entry of butter,

and a record of methods used. The butter upon arrival was numbered, and any marks of identification removed, so that when scored no partiality could possibly be shown. The criticism of the judge and a reference to the method blank, furnished the foundation for a letter of criticism, which was in due time sent to the contestant. Mr. C. L. Mitchel, Dairyman in the Dairy Division of the United States Department of Agriculture, directed the scoring, and his familiarity with the butter markets, as well as his proven ability as a judge, made the contest the more practical.

Score card used:

UNIVERSITY OF CALIFORNIA—COLLEGE OF AGRICULTURE.

DAIRY INDUSTRY.

BUTTER SCORE CARD.

Name .....

No. .... Date .....

PERFECT	SCORE	CHECK
45	FLAVOR	Rancid ..... Over-ripe cream ..... Bitter cream ..... .....
25	BODY	Worked too much ..... Worked not enough ..... .....
15	COLOR	Too high ..... Too light ..... Mottled ..... Streaked .....
10	SALT	Too much ..... Not enough ..... .....
5	PACKING	Poor packing ..... Poor package ..... .....
100	TOTAL	.....

Scored by .....

Per cent. of moisture .....

Per cent. of salt .....

In order that the attending expenses be met, each contestant was asked to donate his first entry and to pay all express charges on succeeding entries. Aside from the first entry, all receipts from the butter, which was reworked and packed, have been refunded. The liberality of some of the supply men and commission men swelled the premium fund to \$280, sufficient for the purchase of four prize cups, which were competed for under the following rules:

“There will be one class—Creamery Butter—and three prize cups for those having the three highest averages, respectively, of the six separate scorings during the year.”

Method blank:

UNIVERSITY OF CALIFORNIA—COLLEGE OF AGRICULTURE.  
EDUCATIONAL BUTTER SCORING CONTEST.

METHOD BLANK.

Fill in and return to Dairy Industry, University Farm, Davis, Calif.

Name of creamery .....	Creamery at .....	
Manager .....	Buttermaker .....	
Milk or cream received when .....	Date churned .....	
What portion gathered cream .....	Do you grade .....	How .....
What portion milk .....	Condition of milk or cream .....	
	Age .....	
Pounds of cream churned .....	Pounds of fat churned .....	
Pasteurized at what temperature .....	Cooled to .....	Ripened at .....
Per cent. of starter added .....	Cream ripened to what per cent. acidity .....	
Cooled to what temp. before churning .....	Time held before churning .....	
Time to churn .....	Buttermilk temperature .....	Test .....
	Size of butter granules .....	
Manner of washing .....	Wash water temperature .....	Number of washings .....
Revolutions worked .....	One or two workings .....	
Butter churned, pounds .....	Overrun, pounds .....	Per cent. .....
Butter color, brand .....	Amount .....	Rate .....
Salt, brand .....	Amount .....	Rate .....
Starter culture, brand .....	Washing powder, brand .....	
Separator, make .....	Pasteurizer, make .....	
Ripening vat, make .....	Churn, make .....	
Your moisture test .....	Our moisture test .....	
Your score of entry .....	Our score .....	

We must have this report in as complete form as possible, with each entry. Helpful criticisms depend upon it.

## DIRECTIONS FOR SHIPPING.

Answer the questions in this entry blank carefully. Your answer will help us in criticizing your butter.

Paek butter in a 20-pound collapsible cube or in a cube made from clean, light lumber. The latter should be 9"  $\times$  9"  $\times$  6" inside dimensions, and is conveniently constructed from material used in the unreturnable butter cases. Paraffine and line with parchment paper.

When shipping place this cube inside a larger one giving 2" space on all sides. The space between should be packed solidly with paper. Cool cube of butter several hours before its final packing. Never ship directly from churn. Send in time to allow one or two days in our cold storage rooms before scoring.

Attach enclosed shipping tag to your package. Prepay express.

"A suitable prize will be awarded to the individual sending either *five* or *six* consecutive entries showing the most marked improvements in methods and quality."

"Contestants are limited to one prize."

"The butter submitted shall represent the regular run."

Other rules provided for the issuance of certificates of merit to holders of an average score of 92 on six entries, or an average score of 93 on five entries.

From the standpoint of uniformity of manufacture and business methods, every buttermaker should keep some record of his operations, including acidity, starter, buttermilk test, overrun, moisture tests, etc., but for the thorough criticism of his product it is essential that he furnish to the judge an outline of his methods. Blanks similar to form on page 4 were provided for this purpose, containing only such questions as seemed related to the work of the contest, and the response from the contestants was quite satisfactory.

The data following on the succeeding pages are the summarized method blanks, also the score, moisture and salt tests, and the criticisms made by the judges. To the buttermaker who will study these there are many valuable points to be gained. There should be a relation between the score and criticism of the butter, condition of cream, acidity, temperatures used in ripening and churning, the washing, working, etc. A careful study will reveal instances where cream in good condition has resulted in a poor butter, due to methods employed,—and on the other hand, where the skill of the maker, and his excellent knowledge of every detail, has enabled him, by application of his ideas, to turn out an acceptable product from raw material which was not the best.



## FIRST ENTRY.

Entry No.	Creamery	Score	Age of Cream	% Fat	Pasteurized	% Starter	Hours held before churning	Acidity at churning	Churning temp.	Buttermilk temp.	Wash water temp.
8	Bodega Creamery	94	2½	35	.....	10	18	.58	56	55	62
17	Sierra Creamery	93½	2	35	.....	8	20	.40	53	54	55
20	Univ. Farm Creamery	93½	2-5	30	185	14½	2½	.52	58	60	60
23	Laton Co-op. Creamery	93	1	30	.....	15	11	.52	56	58	58
19	Castroville Creamery	92½	2	30	.....	18	24	.58	54	58	60
12	Ceres Creamery	92½	1-2	.....	.....	7	10	.....	60	60	67
5	Pioneer Creamery	92½	1-4	30	170	35	14	.....	50	55	60
2	Richfield Creamery	92½	1-4	30	.....	.....	12	.....	.....	.....	.....
1	Suisun Creamery	92½	1-3	35	.....	20	12	.58	54	55	54
11	Santa Ysabel Creamery	92	1-6	.....	.....	.....	.....	.....	.....	56	60
7	Calif. Poly. Creamery	92	2-4	35	160	13	12	.57	48	50	54
6	Stockton Creamery	92	4	27½	.....	14	14	.....	60	63	66
4	Dixon Creamery	92	2-3	35	.....	.....	4	.....	60	62	60
22	Corcoran Creamery	91½	1-2	40	172	12	4	.....	52	54	60
14	Turlock Creamery	91½	2-4	30	.....	7	12	.....	60	58	60
15	Bay View Creamery	91	2-9	32	.....	.....	.....	.....	56	58	58
13	Tulare Co-op. Creamery	91	1-2	.....	170	15	18	.6	.....	57	59
3	Diamond Creamery	90½	3	42	.....	15	20	.42	54	56	56
9	Salinas Creamery	90½	2-3	28	.....	15	3	.....	52	55	63
18		89	.....	.....	.....	.....	.....	.....	.....	.....	.....
16		89	2	33	.....	.....	.....	.....	.....	60	58
21		87½	1-2	44	.....	10	26	.52	54	56	58
10		87½	1½	37	.....	20	3	.....	60	60	60
Average		91.46	2½	33½		14½	13½	.51	55	57	59

The butter in the first entry that scored *highest* was made as follows:

To cream which was two and a half days old, in fair condition, testing 35 per cent. fat, 10 per cent. starter was added, and after holding 18 hours .58 per cent. acidity had been developed. The churning temperature was 56° and churning continued until the granules were about the size of peas. The wash water was at a temperature of 62°. The butter was salted at the rate of 1 ounce of salt to 100 pounds of butter. A commercial starter was used.

FEBRUARY 8, 1910.

Entry No.	Revolutions worked	Make of Churn	% Overrun	% Moisture	% Salt	Criticisms
8	.....	Sq.	22	14.95	1.63	Clean flavor; excellent body
17	.....	S.	.....	12.25	1.57	
20	15	S.	18	12.6	1.28	
23	.....	S.	24	13.85	1.63	Weak body
19	.....	Sq.	22	14.3	1.53	Trifle unclean flavor; weak body
12	.....	D.	.....	14.25	2.10	Fair flavor; untidy package
5	.....	S.	20	14.3	0.93	Flat, unclean flavor
2	.....		.....	13.05	2.04	Salty; gritty
1	.....	V.	18	12.85	1.17	Flat flavor; gummy body
11	.....	V.	.....	11.4	1.75	Unclean; sour
7	.....	S.	20	13.65	1.87	Stale flavor; high salt
6	.....	S.	23	14.35	2.22	Oily flavor; milky brine; high salt
4	.....	V.	22	14.3	2.57	Old cream flavor; high salt
22	.....	D.	22	13.25	1.17	Unclean flavor
14	.....	S.	19	15.25	2.34	Unclean flavor; gritty
15	.....		17	12.95	3.04	Old cream flavor; gritty
13	.....	S.		15.1	2.45	Slightly metallic; coarse body; gritty
3	.....	S.	17	13.55	1.4	Foreign aroma; dirt specks
9	.....	S.	20	13.05	1.05	Tainted flavor; dry body
18	.....		.....	15.85	3.27	Barny flavor; poor package
16	.....	B.	20	12.6	2.28	Coarse salty flavor; gummy body; too high salt
21	.....	S.	19	13.45	3.04	Old cream flavor; weak body; mottled; too high salt
10	.....	S.	.....	14.3	.99	Very unclean; gummy body
			20	13.7	1.88	

\* Sq. = Squeezer; S. = Simplex; D. = Disbrow; V. = Victor; B. = Box churn.

Score, 94; water, 14.95 per cent.; salt, 1.63 per cent.

The butter in the first entry that scored *lowest* was made as follows:

Twenty per cent. commercial starter was added to sweet cream testing 37 per cent., and after holding 3 hours at 60° the cream was churned. It was churned to fine granules, and the wash water temperature was the same as that of the buttermilk, 60°. Salt was added at the rate of 4½ pounds to 100 pounds of fat.

Score, 87½; water, 14.3 per cent.; salt, .99 per cent.

## SECOND ENTRY.

Entry No.	Creamery	Score	Age of Cream	% Fat	Pasteurized	% Starter	Hours held before churning	Acidity at churning	Churning temp.	Buttermilk temp.	Wash water temp.
12	Cayucos Creamery	95	1-2	44	.....	21	10	.52	.....	56	56
17	Pioneer Creamery	94½	1-2	34	160	20	14	.5	48	54	60
7	Ceres Creamery	94	1-2	.....	.....	.....	.....	.....	58	60	62
23	Univ. Farm Creamery	93½	2	30	180	20	0	.5	48	54	50
13	Elite Creamery	93½	1	.....	.....	20	6	.....	.....	56	56
2	Suisun Creamery	93½	½-2	39	.....	25	11	.56	53	55	56
8	Santa Ysabel Creamery	93	2-4	36	.....	.....	12	.....	58	59	61
10	Laton Co-op. Creamery	93	1	31	.....	12	12	.52	50	54	52
19	Calif. Poly. Creamery	93	1-2	37	.....	15	10	.48	54	57	60
25	Salinas Creamery	93	2-3	38	.....	10	2	.6	51	54	61
6	Visalia Creamery	92½	3	33	140	6	24	.....	47	51	51
15	Dixon Creamery	92	.....	32	.....	.....	14	.....	54	56	54
5	Diamond Creamery	92	3	39	.....	25	2	.52	53	56	60
24	Castroville Creamery	92	1-2	42	.....	10	18	.5	52	54	56
14	Scott Valley Creamery	91¾	3	32	.....	10	18	.5	50	56	58
11	Bodega Creamery	91	2	35	.....	12	16	.56	50	56	58
1	Fresno Creamery	91	1	.....	175	20	16	.....	54	56	56
21	Turlock Creamery	91	1-3	27	.....	.....	18	.....	50	56	56
3	Richfield Creamery	91	1-3	26	.....	5	10	.4	56	58	62
9	Hicks Valley Creamery	90¾	1	35	.....	10	.....	.....	56	57	53
16	Bridgeport Creamery	90¾	1-2	34	.....	12	24	.....	.....	57	56
20		89½	2	35	.....	.....	.....	.....	54	56	54
18		89	1-2	28	170	12	14	.6	48	54	57
22		89	1-2	30	165	8	3	.....	54	56	56
4		87	1-2	28	.....	.....	10	.....	50	52	52
Average		91.84	2	34		14	14	.52	52	55	56

The butter in the second entry that scored *highest* was made as follows:

Sweet cream 2 days old with a test of 44 per cent. was ripened to .52 per cent. acidity, by the aid of 21 per cent. of a good commercial starter. It was cooled to 43°, held for 10 hours and churned. The churning was continued until the butter granules were the size of wheat. The buttermilk had a temperature of 56° and tested .09 per cent., and the wash water had a temperature of 56°. Modern equipment was used throughout.

Score, 95; water, 15.35 per cent.; salt, 1.17 per cent.



APRIL 5, 1910.

Entry No.	Revolutions worked	Make of Churn	% Overrun	% Moisture	% Salt	Criticisms
12	.....	S.	22	15.35	1.17	Rich and clean
17	.....	S.	20	14.45	1.75	Clean
7	.....	D.	20	13.8	1.17	Flat but clean; excellent body
23	.....	S.	18	14.7	1.4	
13	.....	C.	.....	12.3	1.63	Clean; brittle body; mottled
2	.....	V.	20	14.35	2.1	High salt
8	.....	V.	20	14.15	2.22	Salty
10	.....	S.	18	13.9	1.58	
19	.....	S.	19	14.35	1.52	Lacks richness
25	.....	S.	21	14.09	2.04	Gritty
6	.....	S.	.....	15.	2.69	Sour flavor; gritty
15	.....	V.	23	15.45	1.93	Unclean
5	.....	S.	20	14.95	1.28	Trifle unclean; streaked
24	.....	Sq.	.....	15.25	1.93	Not good flavor
14	.....	S.	18	13.25	1.81	Unclean; wavy; gritty
11	.....	Sq.	21	14.25	2.77	Salty; mottled
1	.....	S.	.....	16.8	3.39	Coarse; gritty
21	.....	S.	20	17.	2.04	Feed flavor
3	.....	D.	24	14.75	2.34	Old cream; high salt
9	.....	V.	.....	15.15	1.46	Unclean; old; poor package
16	.....	S.	23	13.85	3.04	Unclean; off; mottled; gritty; rough package
20	.....	S.	.....	14.3	2.1	Lacks character; poor package
18	.....	S.	.....	16.3	2.57	Bitter flavor; gritty
22	.....	D.	22	13.85	.81	Old; stale; weak body
4	.....	V.	.....	16.35	2.45	Rancid; weak body; gritty; very poor package
<hr/>			<hr/>	<hr/>	<hr/>	
			20	14.75	1.96	

\* Sq. = Squeezer; S. = Simplex; D. = Disbrow; V. = Victor; B. = Box churn; C. = Curtis.

The butter in the second entry that scored *lowest* was made as follows:

Cream in apparently good condition, testing 28 per cent., was held 10 hours before churning at a temperature of 50°. Fifty per cent. acidity was developed. No starter was added. The churning temperature was 50°, buttermilk temperature 52°, and wash water temperature 52°. No record of salting was reported, but the test and criticisms indicate that it was not done properly. The butter was put up in a very poor package.

Score, 87; water, 16.35 per cent.; salt, 2.45 per cent.

## THIRD ENTRY.

Entry No.	Creamery	Score	Age of Cream	% Fat	Pasteurized	% Starter	Hours held before churning	Acidity at churning	Churning temp.	Buttermilk temp.	Wash water temp.
18	Univ. Farm Creamery	96	1-2	30	180	14	2	.52	48	53	50
6	Calif. Poly. Creamery	95½	1-2	36	.....	25	10	.56	45	57	58
14	Laton Co-op. Creamery	95	1	32	.....	24	14	.46	48	52	52
15	Bridgeport Creamery	94½	1	.....	.....	10	12	.....	64	66	60
12	Santa Ysabel Creamery	94	2-6	37	.....	.....	12	.....	54	57	58
16	Salinas Creamery	93½	1-2	35	.....	30	5	.42	51	53	60
2	Diamond Creamery	93	1-2	36	.....	18	13	.48	43	54	57
4	Central Creamery	92¼	2	41	.....	21	17	.5	44	54	56
3	Bodega Creamery	92	2½	34	.....	10	15	.64	56	57	62
13	Eclipse Creamery	92	2	.....	.....	.....	48	.....	60	.....	61
10	Richfield Creamery	92	1-3	25	.....	18	10	.6	56	58	62
7	Sierra Creamery	92	1-2	.....	.....	.....	24	.....	54	56	56
1	Fresno Creamery	92	1	31	155	28	14	.....	42	48	48
17	Ceres Creamery	91½	1-2	.....	.....	.....	14	.....	55	62	64
8	Dixon Creamery	91	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	Castroville Creamery	90¾	1-2	.....	.....	10	18	.48	52	54	54
11	Pioneer Creamery	90	½	36	150	20	14	.6	49	56	60
9		89	1-2	37	.....	23	5	.55	51	53	54
Average		92.55	1½	34		19	14	.53	51	50	57

The butter in the third entry that scored *highest* was made as follows:

A fair grade of gathered cream testing 30 per cent., was pasteurized at 180°, cooled to 48°, and 14 per cent. of good commercial starter added. The cream was not ripened, as it contained .52 per cent. acidity. It was held 2 hours at 48°, and churned. Time of churning was 40 minutes, and the granules were the size of wheat. The buttermilk had a temperature of 53°, and tested .02 per cent. The manner of washing was spraying at 50° until the water ran clear from the churn, then adding as much water at 50° as there was buttermilk. There was one working.

JUNE 1, 1910.

Entry No.	Revolutions worked	Make of Churn	% Overrun	% Moisture	% Salt	Criticisms
18	18	S.	20	14.5	1.28	
6	12	S.	18	15.45	1.52	
14	12	S.	18	14.55	1.4	Clean, but lacks richness
15	15	S.	16	15.1	1.75	Clean; peculiar body; mottled
12	16	V.	20	14.35	1.46	Flat, but clean
16	12	S.	21	14.3	.81	Fairly clean; flat; mottled
2	.....	S.	21	14.8	2.16	Lacks richness; high salt
4	.....	S.	21	15.15	1.93	Slightly unclean; mottled; high salt
3	44	Sq.	21	14.4	2.04	Overripe cream flavor; mottled; high salt
13	16	V.	22	13.45	2.16	Unclean, cowy flavor
10	21	D.	21	13.9	1.46	Old stale cream flavor
7	.....	S.	.....	14.2	1.93	Unclean; overripe cream; greasy body
1	.....	S.	16	13.15	.8	Overripe cream flavor; mottled
17	16	D.	.....	13.45	1.4	Poor cream; body not good
8	.....	.....	.....	17.05	2.74	Overripe cream flavor; short grain and slightly greasy; high salt
5	110	Sq.	.....	13.6	2.69	Briny flavor; bad grain; mottled; slightly gritty
11	.....	S.	20	14.65	2.51	Oily to fishy flavor; high salt
9	12	V.	23	14.15	1.22	Cheesy flavor; mottled and uneven color
			19	14.45	1.73	

\* Sq. = Squeezer; S. = Simplex; D. = Disbrow; V. = Victor; B. = Box churn.

Score, 96; water, 14.5 per cent.; salt, 1.28 per cent.

The butter in the third entry that scored *lowest* was made as follows:

Cream in fair condition, age 2 days, testing 37 per cent., was ripened for 5 hours to an acidity of .55 per cent. Twenty-three per cent. of starter was used. When churned it had a temperature of 51°, and the buttermilk was 53°. There were two washings at 54°, and one working.

Score, 89; water, 14.15 per cent.; salt, 1.22 per cent.

## FOURTH ENTRY.

Entry No.	Creamery	Score	Age of Cream	% Fat	Pasteurized	% Starter	Hours held before churning	Acidity at churning	Churning temp.	Buttermilk temp.	Wash water temp.
8	Golden Creamery	95	1	.....	.....	15	3	.....	50	54	54
2	Laton Co-op. Creamery	94½	1	32	.....	26	8	.5	48	52	52
4	Pioneer Creamery	94	1	.....	154	15	14	.5	49	56	60
13	Ceres Creamery	94	2	.....	.....	3	14	.....	54	62	64
17	Bodega Creamery	93½	2	36	.....	20	18	.55	55	57	62
7	Univ. Farm Creamery	93½	1-3	32	180	18	0	.52	52	56	52
5	Fresno Creamery	93	1-2	32	150	15	16	.....	46	52	56
11	Castroville Creamery	92½	1-3	.....	.....	15	20	.46	50	52	52
6	Dairy Delivery Creamery	92½	1	.....	.....	10	12	.....	51	58	62
14	Elk Grove Creamery	92	2	40	.....	.....	12	.35	58	60	62
1	Eclipse Creamery	91	1-2	32	.....	.....	44	.47	56	58	63
9	Bay View Creamery	91	3-6	35	.....	.....	24	.....	60	62	58
12	Woodland Creamery	91	1-4	.....	160	.....	18	.57	55	58	57
16	Suisun Creamery	91	1-3	41	.....	18	12	.52	48	.....	58
21	Diamond Creamery	91	2-5	34	180	21	10	.58	52	56	58
3	Turlock Creamery	90¼	1-3	29	.....	.....	15	.....	54	58	56
10		89½	1-2	38	180	14	10	.56	56	57	60
20		88½	3-5	.....	.....	.....	3	.....	54	56	56
18		88½	2-3	32	.....	.....	.....	.69	57	59	57
19		88	3-6	34	.....	.....	12	.....	56	57	59
15		87	2	35	.....	.....	12	.6	48	54	66
Average		91.53	2	34		16	14	.53	52	54	58

The butter in the fourth entry that scored *highest* was made as follows:

Cream which had been graded, and which was 1 day old, was ripened with 15 per cent. of starter, at a temperature of 58° for 3 hours. Before churning it was cooled to 50°, and held for 1 hour. The butter came in 45 minutes. There was one washing at the same temperature as the buttermilk, 54°, and but one working. The result was butter of a fine clean flavor, and having good body and texture.

Score, 95; water, 13.45 per cent.; salt, .85 per cent.

AUGUST 1, 1910.

Entry No.	Revolutions worked	Make of Churn	% Overrun	% Moisture	% Salt	Criticisms
8	12	S.	.....	13.45	.85	
2	12	S.	18	12.85	1.31	
4	.....	S.	20	15.6	2.23	Rich, but slightly metallic
13	15	D.	.....	11.65	1.31	Clean, but lacking richness
17	70	Sq.	19	13.55	1.25	
7	18	S.	20	13.46	1.44	Slightly unclean
5	.....	S.	15	13.75	1.25	Foreign flavor
11	140	Sq.	.....	14.3	2.28	Slight old cream flavor
6	12	S.	.....	13.45	1.94	Trifle unclean
14	18	V.	22	13.95	1.48	Not clean flavor
1	16	V.	22	13.55	2.28	Overripe flavor; weak body; mottled; high salt
9	.....	B.	20	13.8	2.28	Old cream flavor
12	22	D.	.....	13.	1.48	Soft body; badly mottled
16	14	D.	20	14.15	2.05	Stale cream flavor; high salt
21	.....	S.	24	14.6	2.8	Cheesy flavor; gritty
3	15	S.	22	13.4	2.11	Old cream flavor; mottled; high salt
10	12	S.	20	13.7	1.43	Old cream flavor
20	14	V.	22	14.75	2.34	Old cream flavor; slightly fishy flavor
18	12	S.	22	13.2	3.88	Fishy flavor; gritty
19	16	V.	19	13.55	1.71	Very cheesy flavor
15	21	D.	23	12.4	1.54	Poor cream flavor
			20	13.62	1.87	

\* Sq. = Squeezer; S. = Simplex; D. = Disbrow; V. = Victor; B. = Box churn.

The butter in the fourth entry that scored *lowest* was made as follows:

Slightly acid cream, testing 35 per cent., was ripened to .6 per cent. acidity at 54°, without the use of starter. The time held before churning was 12 hours, when it was cooled to 48°. Churning was continued for 40 minutes, until the butter came in irregular granules the size of barley. The buttermilk temperature was 54°, but the wash water was at 66°. There was one washing, and two workings.

Score, 87; water, 12.4 per cent.; salt, 1.54 per cent.

## FIFTH ENTRY.

Entry No.	Creamery	Score	Age of Cream	% Fat	Pasteurized	% Starter	Hours held before churning	Acidity at churning	Churning temp.	Buttermilk temp.	Wash water temp.
12	Golden Creamery	95½	1	.....	.....	18	0	.42	54	56	58
9	Castroville Creamery	94½	1-2	.....	.....	14	16	.6	50	54	60
5	Suisun Creamery	94½	1-2	38	.....	18	1	.54	52	56	56
10	Bodega Creamery	94	2	33	.....	25	18	.55	53	56	62
2	Ceres Creamery	94	1-2	.....	.....	6	12	.....	52	60	60
6	Santa Ysabel Creamery	93¾	3-6	34	.....	.....	12	.....	55	56	58
3	Pioneer Creamery	93½	1	31	152	18	14	.5	49	57	62
4	Salinas Creamery	93½	1-2	30	.....	30	2	.58	50	52	61
8	Fresno Creamery	93	2	31	.....	18	14	.....	50	53	54
11	Univ. Farm Creamery	93	1	27	.....	30	16	.65	50	60	52
1	Calif. Poly. Creamery	91½	2-3	26	180	15	6	.57	52	56	58
7	Standish Creamery	91¼	2	28	.....	.....	.....	.....	56	58	56
13		87½	1	31	.....	10	12	.....	52	57	60
Average		93.03	2	32		18	11	.55	52	56	58

The butter in the fifth entry that scored *highest* was made as follows:

Graded cream 1 day old was ripened at 62° to .42 per cent. acidity by the aid of 18 per cent. of starter. It was then cooled to 54° and churned immediately. The buttermilk and wash water were 56° and 58°. Standard culture, and approved equipment were used.

Score, 95½; water, 13.65 per cent.; salt, 1.43 per cent.



SEPTEMBER 26, 1910.

Entry No.	Revolutions worked	Make of Churn	% Overrun	% Moisture	% Salt	Criticisms
12	14	S.	.....	13.65	1.43	Clean and rich
9	90	Sq.	22	15.45	1.83	
5	12	V.	20	14.	1.83	
10	70	Sq.	22	14.6	1.43	Clean flavor; weak body
2	20	D.	.....	12.45	1.6	
6	17	V.	19	14.4	1.25	Not quite clean; body trifle weak
3	14	S.	22	15.3	2.	Flat flavor; mottled
4	23	S.	22	15.1	1.94	Not quite clean flavor
8	.....	S.	20	14.45	1.25	Trifle unclean
11	18	S.	19	15.1	1.25	Worked too much
1	18	S.	20	15.8	2.28	Foreign flavor
7	18	S.	18	12.2	1.94	Sour flavor; overworked; mottled; gritty
13	16	S.	24	13.9	2.97	Rancid; weak body; gritty
			21	14.34	1.77	

\* Sq. = Squeezer; S. = Simplex; D. = Disbrow; V. = Victor; B. = Box churn.

The butter in the fifth entry that scored *lowest* was made as follows:

This butter was made in a creamery where all the sweet cream is used for other purposes, and the sour cream left for churning. That churned tested 31 per cent. fat, and was in poor condition. Ten per cent. of starter was added, and ripening continued for 12 hours. Before churning it was cooled to 52°. The granules were the size of large peas. Buttermilk and wash water were 57° and 60°, respectively. There was one washing and one working.

Score, 87½; water, 13.9 per cent.; salt, 2.97 per cent.

## SIXTH ENTRY.

Entry No.	Creamery	Score	Age of Cream	% Fat	Pasteurized	% Starter	Hours held before churning	Acidity at churning	Churning temp.	Buttermilk temp.	Wash water temp.
9	Calif. Poly. Creamery	95	2-3	38	.....	.....	½	.56	53	56	52
11	Ceres Creamery	94½	1-2	.....	.....	.....	10	.....	57	60	64
4	Univ. Farm Creamery	94¼	1	27	180	18	2	.54	52	58	54
5	Santa Ysabel Creamery	94	2-6	35	.....	.....	12	.....	52	54	56
8	Castroville Creamery	94	1-2	.....	.....	24	19	.66	56	58	62
3	Salinas Creamery	93½	1-2	33	.....	20	1	.5	55	58	60
7	Pioneer Creamery	93¼	1	30	154	22	14	.6	49	56	62
12		93	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	Standish Creamery	93	3-4	28	.....	.....	.....	.....	55	58	58
6	Dairymen's Co-op. Cry.	92¾	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	Bodega Creamery	92¼	3	36	.....	20	16	.55	54	56	62
2	Suisun Creamery	92	1-2	35	.....	24	2	.52	54	56	58
13	Visalia Co-op. Creamery	91	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average		93.27	2	33	.....	21	8	.56	54	57	59

The butter in the sixth entry that scored *highest* was made as follows:

Cream testing .38 per cent., was received in good condition, age 2 to 3 days. It was ripened at 59° to an acidity of .56 per cent. The use of starter is not reported. After cooling to 53°, and holding 30 minutes, it was churned until the butter granules were the size of barley. Churning took 45 minutes. There were two washings at 52° and 48°, respectively, and one working.

Score, 95; water, 13.75 per cent.; salt, 1.37 per cent.

No method blank was received for the butter scoring lowest in the sixth entry, but the fact that the butter scored 91 does not reflect seriously on methods. One of the prominent criticisms was grittiness, but later correspondence reveals that this was due to a temporary defect in the brine system, rather than to intentional heavy salting.

Score, 91; water, 13.4 per cent.; salt, 2.4 per cent.

## FLAVOR.

The most important point to be considered in scoring butter is flavor. The demand for a particular brand of butter may be traced

NOVEMBER 21, 1910.

Entry No.	Revolutions worked	Make of Churn	% Overrun	% Moisture	% Salt	Criticisms
9	15	S.	20	13.75	1.37	
11	25	V.	.....	14.25	2.23	Clean but flat
4	16	S.	18	14.05	1.37	Clean but flat; crumbly body
5	19	V.	18	11.55	1.83	Not quite clean; streaked
8	220	Sq.	22	13.35	1.6	
3	27	S.	21	15.2	2.05	Not quite clean
7	15	S.	24	15.15	2.05	Briny flavor; streaked
12	.....	.....	.....	16.1	1.83	Crumbly body
1	18	S.	18	12.	1.71	Not quite clean; streaked color
6	.....	.....	.....	14.35	1.65	Old flavor; gummy body
10	50	Sq.	20	14.5	2.63	Briny but clean; weak leaky body; gritty
2	14	V.	19	13.9	2.05	Unclean; stable flavor; high salt
13	.....	.....	.....	13.4	2.4	Not clean; weak body; gritty
				13.96	1.9	

\* Sq. = Squeezer; S. = Simplex; D. = Disbrow; V. = Victor; B. = Box churn.

almost directly to its quality, and butter of high quality, possessing that delicate mild flavor, is always sold at a premium. Fully 90 per cent. of the unfavorable criticisms on flavor are due to conditions of handling, over which the buttermaker has no control. Unclean, cowy, barny flavors are the result of dirty methods. Stale, overripe, and sour, are terms used to designate the flavors which are the result of too long holding of cream. Rancid flavor is a serious defect resulting from extensive decomposition, whereby the non-volatile fats are acted upon by bacteria, become volatile and escape. Cheesy flavor is the result of a fermentation, but this time it is the proteid materials—casein in cream, curd in butter, which are acted upon. It is an injustice to the consuming public that such cream be manufactured into butter. Suggestions as to the improvement of raw material are made later.

As a contrast to the large number of defects in flavor, for which the buttermaker is not responsible, are the small number of criticisms under flavor, due to methods of manufacture. They include fishy flavor, oily flavor, and metallic flavor. The two former may be closely associated, although oily flavor is perhaps the result of too high ripen-

ing, churning, and working temperatures. Fishy flavor is generally recognized by authorities on the subject to be the result of overworking butter which is made from high acid cream. The remedy for these defects is obvious. Metallic flavor is probably due to the pasteurization of a rich cream. It is likely to occur when cream which tests much over 35 per cent. is pasteurized. Metallic flavor may also be due to holding milk or cream in rusty containers.

#### BODY.

Next in importance to flavor is body. Body refers to the firmness or substance of the butter. On the San Francisco Dairy Exchange, the body of butter classes as *extras* must be "firm and solid, with perfect grain or texture, free from salviness." Under this head is also included texture, or grain, which refers to the appearance rather than to the firmness or substance. Perfect texture shows a grain which may be spoken of as having a flinty appearance when a trier full is broken. Body and texture influence the brine, both as to appearance and amount.

Weak or greasy body is due to high temperatures and overworking, whereby the fat is made to become soft, and grain is destroyed. Cooling the butterfat quickly after churning and working at a low temperature tends to produce a brittle, or crumbly body. Milky brine is due to lack of thorough washing. Leaky butter is caused by a lack of thorough incorporation of wash water, through washing in a fine granular form with cold water, then working insufficiently. Leaky butter is objectionable to consumers because of appearance. The presence of this free moisture, however, is no indication of a high moisture content. Dry body is caused by excessive churning, or high churning temperatures.

The importance of proper temperatures and manipulations is apparent. These can be determined only by a careful study of local conditions, with regard to season and the feed which the cows receive. In the spring when pastures are opened, the percentage of soft fats is usually increased, necessitating lower temperatures than at periods of the year when the butterfat is harder as a result of dry feed. The number of revolutions for working varies with the make of churn. The only general rule to follow is to work sufficiently to dissolve salt, prevent mottles, and leave butter with good texture.

## COLOR.

The most serious defects under color are mottles, wavy or streaked. They refer to a difference or unevenness of color, and appear in butter as irregular, lighter, and darker portions, and often as spots.

The general opinion regarding these defects seems to be that they are the result of uneven salting. This is in part the cause, but another factor enters, and that is the presence of buttermilk or casein compounds. Salt as put into butter should be dissolved by the water present, and a brine solution result. If butter contains casein compounds, left in by failure to remove all the buttermilk, they are acted upon and hardened by this brine solution. Consequently, when the butter is worked streaks and spots result. Where these streaks and spots occur the lighter portions are due to the presence of casein compounds. The yellow and clear portions are free from these, and the fat is surrounded by clear brine. Well washed butter very seldom shows mottles, unless the salting is done unevenly.

Mottled or streaky butter, then, may be prevented by churning at a low temperature to keep the butter in fine granules, washing thoroughly, and working sufficiently to insure equal distribution of salt. Even under these conditions a certain amount of buttermilk will be retained within the granules, but not sufficient to cause these defects.

Mottles or streaks do not necessarily detract from the palatability and wholesomeness of butter, but the fact that present day markets are governed, to a great extent, by appearances makes it the more important that every buttermaker guard against them.

The demands of different markets in the state made impossible any criticism regarding the shade of color. It was the general opinion of the judges, however, that a large amount of California butter is too light in color, the more so because the great activity which is now going on among the manufacturers of butter substitutes. It would seem clear to most creamerymen that the use of butter color should be strongly advocated, especially at such times of the year as when the natural color is light. However, a large number still cater to certain markets regardless of the injury they work on themselves in the long run. The competition of the so called substitutes has barely begun, and with the present high price of butter no creameryman should fail to do all in his power to protect the dairy industry.

## SALT.

It is surprising the number of gritty entries which were sent in during the year. Grittiness from the standpoint of the consumer is



a very serious defect, even more so than some of the minor defects in flavor. It refers to an amount of salt in excess of that which the water present in the butter can dissolve. It may be due to the intentional use of a large amount or to uneven salting. There is no definite relation between grittiness and salt content. Gritty samples were found which contained as low as 1.8 per cent. salt, thus showing that the defect is the result of improper incorporation. This general defect under salt would seem to emphasize the need of more attention to this part of the process of buttermaking. If the market calls for a high salted butter, buttermakers will perhaps find no better guard against grittiness than by wet salting, mixing just sufficient water with the salt to partially dissolve it before adding to butter in the churn. Excessive salting tends to cover flavor, good as well as bad. Severe criticisms were not made on salt unless an extreme amount was perceptible to the taste. The average salt content for the year was 1.85 per cent., which may be taken as a very satisfactory percentage. The individual tests varied all the way from .8 per cent. to 3.88 per cent.

#### PACKAGE.

Any box or tub into which butter is put should be clean and attractive, and the butter should be packed neatly in it. No cuts were necessary under package, except in one or two instances where the boxes were soiled, made of very rough lumber, or in which the butter had not been carefully packed. One sample contained black specks, which were presumably particles of grease which had worked in through the bearings of the ripener or churn. It should never be necessary to make criticisms on package, especially in a contest. The manner in which a buttermaker packs his butter is an indication of the neatness and care with which other parts of his work are done. It is doubtful whether good butter in a poor package will find such a ready sale as poor butter in a clean, neat, and attractive package. The consumer cares for looks as well as taste.

#### WINNERS FOR THE YEAR.

	Av. Score
Highest average score .....	93.95
E. H. Hagemann, University Farm Creamery, Davis (not competing).	
First prize cup .....	93.41
Simon Koppes, Ceres Creamery, Ceres.	
Second prize cup .....	92.95
Ira King, Pioneer Creamery, Ferndale.	
Third prize cup .....	92.87
A. Jensen, Castroville Creamery, Castroville.	
Special prize cup for improvement in methods and quality .....	92.8
J. A. Jorgensen, Salinas Creamery, Salinas.	



## CERTIFICATES OF MERIT.

Certificates of merit were issued to the above contestants, also to the following:

M. Resendes, Bodega Creamery, Bodega .....	92.79
F. T. Aitken, California Polytechnic School Creamery, San Luis Obispo .....	92.75
L. Hansen, Santa Ysabel Creamery, Paso Robles .....	92.45
V. Baciaroni, Suisun Creamery, Suisun .....	92.08
N. J. Beck, Visalia Co-operative Creamery, Visalia .....	93.3

## SUMMARIZED SCORES.

		1	2	3	4	5	6	Av.
E. H. Hagemann	Davis	93 ½	93 ½	96	93 ½	93	94 ¼	93.95
Simon Koppes	Ceres	92 ½	94	91 ½	94	94	94 ½	93.41
Ira King	Ferndale	92 ½	94 ½	90	94	93 ½	93 ¼	92.95
A. Jensen	Madera-Castroville	93 ½	92	90 ¾	92 ½	94 ½	94	92.87
M. Resendes	Bodega	94	91	92	93 ½	94	92 ¼	92.79
F. T. Aitken	San Luis Obispo	92	93	95 ½	89 ½	91 ½	95	92.75
L. Hansen	Paso Robles	92	93	94	88	93 ¾	94	92.45
V. Baciaroni	Suisun	92 ½	93 ½	89	91	94 ½	92	92.08
N. J. Beck	Laton-Visalia	93	93	95	94 ½	....	91	93.3
J. A. Jorgensen	Salinas	90 ½	93	93 ½	....	93 ½	93 ½	92.8

## AVERAGE FOR YEAR.

	Av.	Av.	Av.	Av.	Av.
Date	Score	Score	Moisture	Moisture	Salt
	1910	1909	1910	1909	1910
First entry .....	91.46	90.97	13.7	13.7	1.88
Second entry .....	91.84	92.34	14.75	13.6	1.96
Third entry .....	92.55	91.67	14.45	13.2	1.73
Fourth entry .....	91.53	92.31	13.62	12.8	1.87
Fifth entry .....	93.03	91.26	14.34	13.2	1.77
Sixth entry .....	93.27	92.05	13.96	13.3	1.9
	—	—	—	—	—
Yearly average .....	92.28	91.76	14.13	13.3	1.85

## LIST OF CREAMERIES TAKING PART IN YEAR'S WORK.

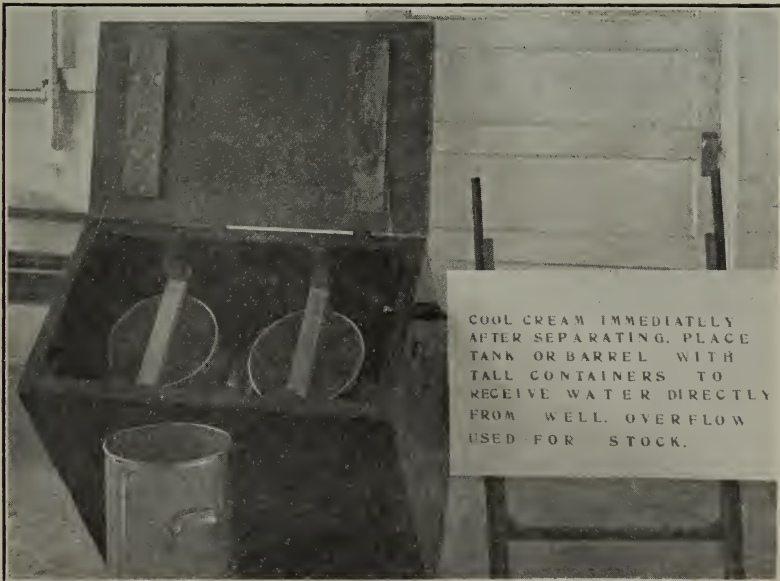
Bay View Creamery	Napa
Bodega Creamery	Bodega
Bridgeport Creamery	Manchester
California Creamery	Oakland
California Cream and Butter Co.	Fresno
California Polytechnic School Creamery	San Luis Obispo
Castroville Creamery	Castroville
Cayucos Creamery	Cayucos
Central Creamery Company	Cayucos
Ceres Creamery	Ceres
Coreoran Creamery	Coreoran
Dairy Delivery Company	Gustine
Dairyman's Co-operative Creamery	Tulare
Diamond Creamery	Cayucos
Dixon Creamery	Dixon
Eclipse Creamery	Beatrice
Elite Creamery	Nicasio
Elk Grove Creamery	Elk Grove
Fresno Creamery	Fresno
Golden Creamery	Etna Mills
Hicks Valley Creamery	Petaluma
Laton Co-operative Creamery	Laton
Lemoore Cream and Butter Co.	Lemoore
New Era Creamery	Gustine
Pioneer Creamery	Ferndale
Richfield Creamery	Corning
Salinas Creamery	Salinas
Santa Ysabel Creamery	Paso Robles
Scott Valley Creamery	Etna Mills
Sierra Creamery	Madera
Silva's Creamery	Santa Rosa
Standish Creamery	Standish
Stockton Creamery	Stockton
Suisun Creamery	Suisun
Tulare Co-operative Creamery	Tulare
Turlock Creamery	Turlock
University Farm Creamery	Davis
Visalia Creamery	Visalia
Visalia Co-operative Creamery	Visalia
Woodland Creamery	Woodland

## THE IMPROVEMENT OF QUALITY.

One of the most conspicuous features noticed in connection with the second contest, as well as the first, is the poor quality of cream which is generally received at California creameries. A study of the summarized method blanks reveals that cream is delivered at ages varying from one to nine days. There is no occasion to believe that

patrons, who will not deliver cream oftener than every three or four days, observe any precautions of handling or cooling the cream, and it is obvious that no buttermaker is able to make an extra grade of butter when compelled to work with a poor raw product. There is little doubt but that most buttermakers who have competed in the contest would have been in line for prizes had they been able to control all ripening processes from the time when the cream which they handled was separated.

The improvement of quality is one of the most serious problems confronting creamerymen. The lack of a system of grading, whereby quality would influence the amount of the patron's pay check, may be taken as a cause of present conditions. There is little incentive for the production of a high grade product on the part of the dairy farmer, whose business is cream production, for the cost of improvement is not met by a corresponding raise in price. The raising of the standards of cream production will depend on the extent to which creamerymen will coöperate. Aside from coöperation, they may do much to educate their patrons. One of the strongest ways of impressing upon patrons the necessity of cleanliness, and proper methods of handling, is to set the example in the creamery. What inspiration is there for a patron who delivers his cream to a creamery, where the receiving platform is a mixture of disorder and filth, where the sink



is always full of dirty greasy water for washing cans, and where the weigh man himself is repulsive to look at. Such conditions are not uncommon. Another means of interesting patrons is to create an interest in the grade of butter turned out. Dairy farmers and creamery patrons are proud to have their community noted for its continuous supply of Extras, or for their creamery to win a prize cup. Such are evidences of thrift.

As suggestions for improving quality, the following results<sup>1</sup> are referred to:



#### EFFICIENCY OF CREAM COOLER.

Rate of inflow, 75 gallons per hour.

Periods	½ hour	1 hour	1½ hours	2 hours	2½ hours
Temperature air .....	89°	89°	89°	88°	88°
Temperature water .....	70	70	70	70	70
Temperature milk .....	96	83	77	75	74
Temperature milk, untreated .....	100	100	98	97	95

The milk was heated to 100° F., and one can was put in the cooler, which had water at a temperature of 70° running through it. In two and a half hours it had been cooled to 74°. The can of milk which was stood at air temperature cooled only to 95°.

<sup>1</sup> California Agricultural Station Bulletin 209.

EFFECT OF INSULATING 10-GALLON CANS IN DIFFERENT WAYS.

Milk kept in shade.

	Start	1 hour	3 hours	5 hours	
Temperature of air .....	99°	100°	99°	98°	
Temperature of contents of can {	Dry felt cover .....	60	62	65	66
	Wet burlap cover ....	60	62	66	67
	No cover .....	60	61	78	82

The figures show that there was a raise of but 7° when cans were insulated, while there was a raise of 22° in cans that were not insulated.

OVERRUN.

The matter of overrun is an ever interesting and important subject to every buttermaker. The method of calculation has been noted in former circulars, but still it would seem that the proper method is still vague to some of the contestants. Overrun must be calculated from the fat paid for. It is a mistake to take the weights of cream received and multiply the same by the per cent. of fat in the ripening vat or churn, as determined by testing the same, unless payment is made on that basis.

One method blank reports a 23 per cent. overrun, and the butter when tested resulted as follows:

Water	12.40
Salt	1.54
Curd	.91
	<hr/>
	14.85

$$100 - 14.85 = 85.15 \text{ left for fat.}$$

The per cent. of overrun possible, when the resulting butter tests 85 per cent., with no churning losses considered, would be 17.64 per cent.

EXPLANATION.

Formula for calculating per cent. overrun is:

$$\frac{\text{Pounds butter made} - \text{pounds fat paid for}}{\text{pounds fat paid for}} \times 100.$$

If 85 per cent. of fat were in the butter, then 85 pounds of fat would make 100 pounds of butter.

$$\frac{100 - 85}{85} \times 100 = 17.64.$$

The difference between the reported overrun and the above would be:

$$23 - 17.64 = 5.36\%.$$

In order for the butter in question to have given a 23 per cent.



overrun, when no losses of any nature were considered, it would have to have contained 16.25 per cent. water, or about 4 per cent. more than was actually present.

One factor, however, may be considered in this connection. A certain amount of shrinkage takes place in butter during the shipping and storing process. From the incomplete data at hand, it is impossible to estimate this loss, but an average may be taken as 1 to 2 per cent. It is possible for every buttermaker to determine his individual loss, if he will make a careful test of the butter sent in to each contest, and compare the same with the test made by this department.

In making moisture tests, there are several important factors which must be kept in mind:

- (1) Obtaining a representative sample.
- (2) Preparation of sample to insure a homogeneous mixture of constituents.
- (3) Accurate scales and dry containers.
- (4) Evaporating to constant weight.

#### THE BABCOCK TEST FOR BUTTERFAT IN BUTTER.

The present agitation among creamerymen all over the country regarding the adoption of a fat standard in butter has resulted in a renewed interest in the testing of butterfat in butter by the Babcock test. There are several factors which influence the accuracy of the Babcock test for butter, as compared with the gravimetric or official method. First, the impracticability of using scales more delicate than moisture scales; second, the low specific gravity of butterfat, and the large percentage of fat in butter; third, the impossibility of getting an exact reading, in bottles graduated not closer than .5 per cent.

With the object in mind of testing the reliability of the Babcock test for butter, all of the samples of butter sent in for the third entry were tested by the method noted below. The results obtained were encouraging when compared with those made by the official method.

Method.—Get a representative sample of butter by taking parts from different places in churn, cube, or square. Prepare sample as for moisture testing, by warming at a temperature not over 120° F., until the butter becomes liquid. Shake thoroughly while cooling to a solid form. Using the Torsion moisture scales, weigh exactly 9 grams into a counterpoised porcelain dish which is provided with a lip for pouring. Melt the 9 grams of butter over an alcohol flame, being careful not to burn it, and pour into a 55 per cent. bottle. The butter which adhered to the dish may be washed into the bottle by using a



half pipette of hot distilled water. Allow the mixture of fat and water to cool, and add about one-half measure of acid. After running in the tester the same as cream, place bottles in hot water at 135°, for 15 minutes. The fat column must be below the level of the water, in order that it be brought to the proper temperature for reading, 135° F. The meniscus may be done away with by adding one-fourth inch of glymol<sup>2</sup> to the bottles as they are taken from the water bath.

#### CONTEST FOR 1911.

It is to be regretted that more buttermakers did not take part in the year's work just closed. The lack of interest is hard to account for. With the large number of creameries everywhere throughout the state, there should be at least fifty entries sent in to every bi-monthly contest. It is planned to begin the work in 1911, and it is hoped that creamerymen will show sufficient interest to justify the continuance of such.

All correspondence regarding the contests should be addressed to

DAIRY INDUSTRY,  
UNIVERSITY FARM,  
DAVIS, CALIFORNIA.

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<sup>2</sup> Purdue Bulletin 145.

